

CLAIMS

1. A regulatory agent of Snail activity, which is an isolated DNA of any one of the following (a) to (d):
 - 5 (a) a DNA encoding a protein comprising the amino acid sequence of SEQ ID NO: 1, 2, 26, 28, 30, 32, 34, 36, 38, 40, or 42;
 - (b) a DNA comprising the sequence of SEQ ID NO: 3, 4, 25, 27, 29, 31, 33, 35, 37, 39, or 41;
 - (c) a DNA encoding a protein comprising an amino acid sequence with one or more amino acid substitutions, deletions, insertions, and/or additions in the amino acid sequence of SEQ ID NO: 1, 10 2, 26, 28, 30, 32, 34, 36, 38, 40, or 42; and
 - (d) a DNA hybridizing under stringent conditions with the sequence of SEQ ID NO: 3, 4, 25, 27, 29, 31, 33, 35, 37, 39, or 41.
- 15 2. A regulatory agent of Snail activity, which is a vector into which a DNA of any one of the following (a) to (d) is inserted:
 - (a) a DNA encoding a protein comprising the amino acid sequence of SEQ ID NO: 1, 2, 26, 28, 30, 32, 34, 36, 38, 40, or 42;
 - (b) a DNA comprising the sequence of SEQ ID NO: 3, 4, 25, 27, 29, 31, 33, 35, 37, 39, or 41;
 - (c) a DNA encoding a protein comprising an amino acid sequence with one or more amino acid 20 substitutions, deletions, insertions, and/or additions in the amino acid sequence of SEQ ID NO: 1, 2, 26, 28, 30, 32, 34, 36, 38, 40, or 42; and
 - (d) a DNA hybridizing under stringent conditions with the sequence of SEQ ID NO: 3, 4, 25, 27, 29, 31, 33, 35, 37, 39, or 41.
- 25 3. A regulatory agent of Snail activity, which is an isolated protein encoded by a DNA of any one of the following (a) to (d):
 - (a) a DNA encoding a protein comprising the amino acid sequence of SEQ ID NO: 1, 2, 26, 28, 30, 32, 34, 36, 38, 40, or 42;
 - (b) a DNA comprising the sequence of SEQ ID NO: 3, 4, 25, 27, 29, 31, 33, 35, 37, 39, or 41;
 - 30 (c) a DNA encoding a protein comprising an amino acid sequence with one or more amino acid substitutions, deletions, insertions, and/or additions in the amino acid sequence of SEQ ID NO: 1, 2, 26, 28, 30, 32, 34, 36, 38, 40, or 42; and
 - (d) a DNA hybridizing under stringent conditions with the sequence of SEQ ID NO: 3, 4, 25, 27, 29, 31, 33, 35, 37, 39, or 41.
- 35 4. An agent for suppressing Snail activity, which is an antisense oligonucleotide targeting a

DNA sequence comprising the sequence of SEQ ID NO: 3, 4, 25, 27, 29, 31, 33, 35, 37, 39, or 41.

5. An agent for suppressing Snail activity, which is a double-stranded RNA comprising a sequence identical or similar to a portion of a DNA comprising the sequence of SEQ ID NO: 3, 4, 25, 27, 29, 31, 33, 35, 37, 39, or 41.
10. 6. A pharmaceutical for treating cancer, which comprises a nucleotide or vector of any one of the following (a) to (c), as an active ingredient:
 - (a) an antisense oligonucleotide of a DNA comprising the sequence of SEQ ID NO: 3;
 - (b) a vector into which an antisense oligonucleotide of a DNA comprising the sequence of SEQ ID NO: 3 is inserted; and
 - (c) an oligonucleotide that is a double-stranded RNA comprising a sequence identical or similar to a portion of a DNA comprising the sequence of SEQ ID NO: 3.
15. 7. A pharmaceutical for treating cancer, which comprises the agent for suppressing Snail activity of claim 4 or 5 as an active ingredient.
20. 8. An EMT-inducing agent, which is an isolated DNA of any one of the following (a) to (d):
 - (a) a DNA encoding a protein comprising the amino acid sequence of SEQ ID NO: 1, 2, 26, 28, 30, 32, 34, 36, 38, 40, or 42;
 - (b) a DNA comprising the sequence of SEQ ID NO: 3, 4, 25, 27, 29, 31, 33, 35, 37, 39, or 41;
 - (c) a DNA encoding a protein comprising an amino acid sequence with one or more amino acid substitutions, deletions, insertions, and/or additions in the amino acid sequence of SEQ ID NO: 1,
 25. 2, 26, 28, 30, 32, 34, 36, 38, 40, or 42; and
 - (d) a DNA hybridizing under stringent conditions with the sequence of SEQ ID NO: 3, 4, 25, 27, 29, 31, 33, 35, 37, 39, or 41.
30. 9. An EMT-inducing agent, which is a vector into which a DNA of any one of the following (a) to (d) is inserted:
 - (a) a DNA encoding a protein comprising the amino acid sequence of SEQ ID NO: 1, 2, 26, 28, 30, 32, 34, 36, 38, 40, or 42;
 - (b) a DNA comprising the sequence of SEQ ID NO: 3, 4, 25, 27, 29, 31, 33, 35, 37, 39, or 41;
 - (c) a DNA encoding a protein comprising an amino acid sequence with one or more amino acid substitutions, deletions, insertions, and/or additions in the amino acid sequence of SEQ ID NO: 1,
 35. 2, 26, 28, 30, 32, 34, 36, 38, 40, or 42; and

(d) a DNA hybridizing under stringent conditions with the sequence of SEQ ID NO: 3, 4, 25, 27, 29, 31, 33, 35, 37, 39, or 41.

10. An EMT-inducing agent, which is an isolated protein encoded by a DNA of any one of the
5 following (a) to (d):

(a) a DNA encoding a protein comprising the amino acid sequence of SEQ ID NO: 1, 2, 26, 28,
30, 32, 34, 36, 38, 40, or 42;

(b) a DNA comprising the sequence of SEQ ID NO: 3, 4, 25, 27, 29, 31, 33, 35, 37, 39, or 41;

(c) a DNA encoding a protein comprising an amino acid sequence with one or more amino acid
10 substitutions, deletions, insertions, and/or additions in the amino acid sequence of SEQ ID NO: 1,
2, 26, 28, 30, 32, 34, 36, 38, 40, or 42; and

(d) a DNA hybridizing under stringent conditions with the sequence of SEQ ID NO: 3, 4, 25, 27,
29, 31, 33, 35, 37, 39, or 41.

15. 11. An EMT-suppressing agent, which is an antisense oligonucleotide targeting a DNA
sequence comprising the sequence of SEQ ID NO: 3, 4, 25, 27, 29, 31, 33, 35, 37, 39, or 41.

12. An EMT-suppressing agent, which is a double-stranded RNA comprising a sequence
identical or similar to a portion of a DNA comprising the sequence of SEQ ID NO: 3, 4, 25, 27,
20 29, 31, 33, 35, 37, 39, or 41.

13. A pharmaceutical for treating cancer, which comprises the EMT-suppressing agent of claim
11 or 12 as an active ingredient.

25. 14. A method of screening for a candidate substance for an agent for suppressing Snail activity,
wherein the method comprises the following steps of (a) to (c):

(a) injecting a vector which comprises a reporter gene operably linked under the control of the
E-cadherin promoter, and a test substance into a one-cell-stage embryo;

(b) measuring the expression level of the reporter gene; and

30. (c) selecting a compound that reduces or increases the measured expression level of the reporter
gene, compared with the measured expression level in the absence of the test substance.

15. A wound healing agent, which comprises the regulatory agent of Snail activity of any one
of claims 1 to 3, or the EMT-inducing agent of any one of claims 8 to 10, as an active ingredient.

35. 16. An anti-inflammatory agent, which comprises the agent for suppressing Snail activity of

claim 4 or 5, or the EMT-suppressing agent of claim 11 or 12, as an active ingredient.

17. A regulatory agent of a protein activity that requires Zn, which comprises a protein comprising the amino acid sequence of SEQ ID NO: 1, 2, 26, 28, 30, 32, 34, 36, 38, 40, or 42 as
5 an active ingredient.